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Dissertation on aneurism

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IX.

Dissertation
on
Aneurism.

By

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A dissertation upon a disease of the arteries called Aneurism.

By
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Aneurism.

In looking over the catalogue of diseases for a subject upon which to write a Thesis, it is a very difficult matter for the student in Medicine to decide which one to select from so extended a list. Not having had any practical knowledge, he finds it as easy to write upon one subject as upon another. His knowledge is mearly theoretical, and his books will furnish him a sufficiency of matter, from which to pick and prune until he is tired. When I looked over the Medical works for something, upon which to form a Thesis, I found it impossible to chose. I therefore looked to my practical knowledge, (though it has been very little) deciding that the disease which I had seen most often, would be the one most suitable. That disease was Aneurism. In treating of this disease, it is not my purpose to speak of any of the theories put forth by the Authorities. But I shall endeavour to give a concise account of the disease, its causes, its attendant train of symptoms,

and the treatment I think best to be adopted, as well as the treatment advised by our best modern writers on this subject.

To understand this disease it is proper that I should give some account of the structure and conformation of arteries. The arteries like other parts of the body are duly supplied with nutrient blood vessels, nerves, exhalents and absorbents and are made up of three coats an external, middle and internal, differing from each other in structure, consistence and tenacity. The external coat is the strongest and serves at the same time as the chief means of resistance of the vessel and of connection to surrounding parts. It is composed of condensed cellular membrane of remarkable elasticity and toughness, color white. the inner surface is smooth, the outer surface is rough, uniting it with a cellular sheath with which all the arteries are surrounded, though in different parts of the body, the investing membrane or sheath of the artery is continuous with the fascia of the region in which the artery is situated.

This sheath contains the nerve, (when there is one, for some of the ablest anthors seem to doubt that the artery itself is supplied with nerves) and the vasa vasorum or nutrient blood vessels of the artery. The middle is the thickest of the three coats, fibrous in its texture, and the most of the fibres arranged in a circular direction around the artery, with a few transverse. Upon the muscularity of the middle coat there has been a great deal of discussion by some of the ablest of our Anatomists and Surgeons, and it may seem bold in me to say that it is muscular, yet as it is the general opinion at the present day among our more modern writers and of some of the best of the old writers, from the experience which I have had, though it has been small, from the great experience of others and from repeated experiment I am led to think this coat truly muscular. For although the fibres separate readily from each other, this cannot disqualify them for belonging to the muscular system. The object of this coat seems to be, to assist the heart in supplying the body with nutrient matter.

Its office therefore is alternate dilatation and contraction, and when force is applied in the direction of the fibres. I have found them to resist as much as any other muscle in proportion to their size. But enough upon the muscularity of this coat, for as in the books there appears to be no end to discussion, so with me. This coat is of a yellow colour and very brittle transversely to the artery. The internal coat is a serous membrane the same that lines all the closed cavities of the body, of very delicate texture. This membrane is transparent and easily torn by force applied directly to it.
The above is a general division of the structure of arteries and though there are six distinct laminae or coats, still it would not be proper in connection with my subject, to go into a more extended account than that I have given.
The meaning of the word Aneurism is "A sack containing blood, which communicates with an artery". This sack may be formed of all the coats of the artery, or the external one or two. The dilatation of an artery is considered by some writers as not properly

classed under the head of Aneurism, but as some of the best of the modern authors give the opinion that there is no opposite instruction to be made I shall make none.

The Predisposing cause in almost every case of Aneurism, is a diseased state of the internal or of all the tunics of the artery. The Exciting causes are as various as the opinions of different Surgeons, mental emotions, violent muscular exertion in lifting, jumping, coughing, vomiting and the like, the excessive use of spirituous liquors, are said by those having had great experience, to be the most frequent exciting cause.

As regards the difference of frequency of this disease in the sexes, it has been found in the male much oftener than in the female. From the testimony of Sir A Cooper Mr Lodgson. Mr Guthrie, John Hunter and others the proportion is, as one to seven or eight. The reason I suppose for this great difference is, that females as a general rule do not use intoxicating drinks as freely, nor are they called upon for so great muscular exertion, as males. The period of life at which aneurism is most frequently found Sir Astley Cooper says. is between

thirty and fifty years. This disease is not confined to any one order of arteries, but may occur in all the arteries of the body. The large arteries, however, more frequently take on this disease; and of these, the internal or those nearest the heart more frequently than any others. The reason of which I suppose is, that the nearer the arteries are to the heart, the thinner are their walls in proportion to their diameter, and the large arteries are less muscular than the small ones, being made up almost entirely of elastic tissue, consequently they are less capable of withstanding the violent impulse of the blood. As a general rule the farther you go from the source of circulation, the less liable are the arteries to take on this form of disease. Though aneurisms have been found on almost every artery of any size in the body. The first general division of Aneurism is into True and False. These are subdivided into True and False circumscribed and diffused. Also Aneurism by anastomosis. The simple True aneurism is, the Expansion of all the coats of the artery in a small part of its course, or the expansion effecting a larger extent, and gradually lost. The true circumscribed

is an aneurism having a sack or cyst, for example.
The inside or muscular coat being torn, the internal
coat is forced through the opening, forming a sack
communicating with the artery by a small orifice.
The diffused, is the giving way of all the coats
and the blood injected into the cellular tissue
around. False aneurism, is, when by actual violence
applied immediately to the artery rupturing all the
coats, or from a wound penetrating the artery, as,
when from bleeding at the bend of the elbow, the brachial
artery is incised, the artery throws blood into the
surrounding cellular tissue. The circumscribed
and diffused false are nearly terms used to show
the extent of the effusion. Aneurism by anastomosis
I understand as meaning, that the capillaries of
a portion of integument, communicating freely with
each other, become equally and permanently
dilated, producing an elevation and discolouration
of the part. This form I think belongs more properly
to the class of naevus. The symptoms which characterise
internal aneurism are exceeding obscure, those of external
aneurism, or aneurism of those arteries, the pulsation of

which can be felt by the finger are the following. The patient discovers a small swelling in the part not at all painful. On examination by the Surgeon, it is found to be an elastic, pulsating tumor, diminishing or entirely disappearing by pressure on the cardiac side and increasing by pressure on the distal side. As the tumor increases, the blood coagulates, and by making pressure upon the surrounding nerves it produces pain. The blood continuing to coagulate, and the fibrin of the blood being deposited within the sack, it will not disappear under pressure, the pulsation in the tumor is weaker, and often cannot be felt at all. When the tumor has acquired considerable size, it acts injuriously by its pressure upon surrounding parts. If the disease is suffered to progress, and no remedial measures are taken, the circulation in the diseased artery and in the branches given off beyond, becomes irregular, and the nourishment and warmth of the parts to which the branches of the artery are distributed is diminished. By the constant pressure of the tumor, the parts between it and the surface of the body or of some of the cavities having an external opening, whether they are bone, muscle tendon, or cellular substance, are removed by absorption.

This process being suffered to go on, all the parts are removed until a mere film is left between the sack and the surface which is torn by some apparently slight cause, bringing on a dangerous and sometimes a fatal hemorrhage. The diagnosis from solid tumors, abscesses, or enlarged glands, lying over the track of an artery is of great importance. Although by pressure upon any swelling lying near an artery, but not opening into it, the pulsation of the artery may be stopped, yet the size of the tumor does not diminish, but the whole body of the tumor is pressed down upon surrounding soft parts. A solid tumor lying upon an artery, but not encircling it, may be distinguished from an aneurismal tumor, by lifting it directly from the part, when if the tumor is not connected with the artery the pulsation will not be affected, but if the tumor encircles the artery, the pulsation will be stopped entirely, which would not be the case if the disease of the part was aneurism. When pressure is made upon the proximal side of an aneurismal swelling (if it has existed a long) the sack will diminish in size, and when pressure is made upon the distal side the sack will expand. A solid tumor will not alter its volume by pressure either upon the proximal or distal

side. The prognosis in internal aneurism is generally unfavorable. In external aneurism where the sack can be felt, if the disease has not existed for a great length of time, the prognosis at the present day is exceedingly favourable. A spontaneous cure has taken place in a few rare cases, though if the disease is left to itself, and no Medical or Surgical treatment is adopted, it generally terminates fatally. A spontaneous cure takes place as follows. The blood in the sack coagulates in layers, by which the cavity of the sack is diminished and at last entirely filled up, the clot extends into the canal of the artery, stoping entirely the flow of blood and the increase of the tumor, or the coagula contained in the sack, may be converted into a solid mass, the area of the artery being preserved, by which mass, the bursting of sack (as it is called, though I do not think with propriety) is prevented, and the sack and its contents are gradually removed by absorption. There is a form of Surgical treatment much in vogue at the present day, which is very highly spoken of by our much respected Professor Dr Knight, called compression, the object of which is to bring about the same thing that takes place in a spontaneous cure.

The successfull use of this mode of treatment is almost entirely a modern thing, or when the old authors speak of it at all, they discourage its use, as a means of cure, they say it is very painfull, slow, and not to be relied upon. In this manner of treatment, the artery is to be compressed above the aneurismal swelling where the artery is most superficial and surrounding parts afford a proper point of support for the compression. All the contrivances by which the compression is effected, whether, tourniquet, bandage and compress, or the hands of assistants, must be so managed that they will not confine the whole limb and thereby stop the circulation. This mode of cure I think should always be tried effectually, when it can be brought to bear upon the cardiac side of the aneurismal swelling, before other and more severe means are used, for from the records of some of the most experienced in this matter, nine cases out of ten, have been entirely obliterated. When this mode of cure will be beneficial, it soon shows, and therefore it should never be persisted in too long. The last resort and the only curative means to be relied upon (as the old Surgeons say) is the ligature, or tying the aneurismal

artery. There are two modes of performing this operation the ancient and the modern. The ancient or the one laid down in the treatises on Surgery by the ancient Greeks, consisted in opening the sack, removing its contents and tying the artery above and below the tumor. The other consists in laying the artery bare above the diseased part, in a convenient place and tying the artery there. Other operations have been performed by Abernethy, Hunter, Barnes and others, but not having been thought so good as the one last mentioned they have been rejected. The operation of tying an artery at a distance from the sack, when the coats are healthy, was first successfully performed by John Hunter an Eminent English Surgeon. The effect of a ligature to an artery, is to arrest the flow of blood. The two internal coats being divided, adhesion of these coats takes place, and the lymph effused firmly plugs up the artery. Ulceration of the external coat takes place and the ligature is thrown off entire. In the application of the ligature, care should be taken that it be transverse to the calibre of the artery and also that there be nothing but the artery included in the ligature. For when ulceration of all the coats takes place, secondary

hemorrhage will come on, which is very much to be dreaded. As regards the ligature, it should be round and small, or the coats will not be divided. The material most frequently made use of, is the common hempen thread. After the ligature has been applied, the wound made will be dressed as any other incised wound, with adhesive straps and bandages, taking care to bring one end of the ligature out at the most depending portion of the incision, cutting the other end off close to the knot. The ligature will generally come away or can be drawn out from the wound, some time from the twelfth to the sixteenth day, after which the whole wound will heal kindly. Medical treatment can only be palliative, some of these are, venesection, rigid diet, horizontal position, cold and astringent applications, and the arterial sedatives of which, the digitalis has been used much more than any other. In conclusion I shall give a few of the arteries in which this disease is most frequently found, in the order of their frequency, with the position for the application of the ligature.

The Arch of the Aorta is especially liable to aneurism, producing palpitation of the heart, difficulty of swallowing and an irritating cough from the pressure of the Sac upon the trachea.

Of this form I have seen two examples, both of which burst into the œsophagus, causing immediate death. Aneurism of the abdominal Aorta, takes place just above the bifurcation, producing pressure upon the thoracic duct, dropsy and caries of the spine. These two forms should be treated only by palliative means, for although Sir Astley Cooper and several other eminent Surgeons have tied the abdominal aorta, the operation has never been successful.

Aneurism of the carotid artery, is situated at the angle of the jaw, near the bifurcation of the artery, producing difficulty of swallowing and breathing. The incision necessary to arrive at the artery, should be made along the inner border of the sterno-mastoid muscle and extending from near the angle of the jaw to the cricoid cartilage.

Popliteal aneurism, is situated just above where the artery divides into anterior and posterior tibial arteries in the Popliteal space. The most advantageous place for tying the femoral artery in this form, is on the inner side of the sartorious muscle, about where the artery passes under the muscle. The incisions need not be

made very free, as the artery in this position is very
near the surface.
Aneurism at the bend of the elbow in the humoral
artery is not uncommon. The humoral artery is tied
about the middle of the arm, on the inner edge of the
biceps flexor muscle. The incision should be made about
two inches in length. The irregularity in which the
branches come off from the brachial artery, often give
trouble after tying the main trunk.
The tumor in Axillary aneurism occupies the arm-pit
and some-times extends above the clavicle producing
pain and numbness in the arm. In this form of aneurism
some surgeons tie the subclavian artery above the clavicle,
while others tie the axillary artery below the clavicle.
For all other forms of this disease and the treatment
required I would refer you to the best authors on this
Subject. A.D.S.